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Ethanol plant costs and revenues

	Wet DG		Dry DG
	Iowa	Texas	Iowa
	(\$ per bushel)		
Capital cost	0.72	0.72	0.72
Operating cost	1.37	1.17	1.56
Corn cost (including transportation)	3.71	4.26	3.71
Ethanol transportation cost	0.30	0.03	0.30
Distillers grains transportation cost	0.13	0.07	0.11
Ethanol revenue	5.50	5.50	5.50
Distillers grains revenue	1.07	0.99	1.15
Margin	0.35	0.25	0.25

Linkages Key to Competitiveness

The top five lines of the table above outline the costs per bushel of corn each plant faces. The Texas plant would have a \$0.20 operating cost advantage over the Iowa plant that ships wet DG and a \$0.39 operating cost advantage over the Iowa plant that ships dry DG. These operating cost advantages reflect the drying costs at each plant. The Iowa plants make up some of the cost difference through transportation, as the cost per bushel of moving the corn is higher than that of moving the ethanol and the distillers grains. The Iowa plants have a \$0.22 to \$0.25 transportation cost advantage. The lower half of the table shows the revenues for the plants and their margins, the difference between revenues and costs.

Given our ethanol price assumption, all three plants have ethanol revenues of \$5.50 per bushel of corn. The distillers grains revenues differ across plants, depending on the percentage of distillers grains sold wet versus dry. Because the price of the dry DG is well above that of the wet, the Iowa plants derive more revenue from distillers grains than does the Texas plant. When the costs and revenues are combined, the Iowa plant selling wet DG has the highest margin, earning \$0.35 per bushel of corn, followed by the Texas plant and then the Iowa plant selling dry DG. However, these results are dependent on the transportation cost assumptions and the percentage of distill-

ers grains fed wet versus dry for the Iowa plants. For example, if the Iowa plant with wet DG can sell only 20 percent of distillers grains wet, then its margin drops below the Texas plant. If the Iowa plant with dry DG can sell all of its distillers grains within 250 miles of the plant, then that plant's margin will exceed the margin for the Texas plant. Clearly, opportunities provided by linkages with the livestock industry will determine the relative competitiveness of the different locations. It is also worth noting that the relative cost advantages will change with variations in the relative transportation cost of the different products and co-products.

These results show that Iowa ethanol plants will need to develop stronger linkages to the livestock industry to maintain their competitive edge. The ability to feed wet DG to cattle provides the Texas plant in our example a sizable operating cost advantage. The building of the E3 Biofuels and Panda Ethanol plants indicates that this advantage has attracted some ethanol investors. If Iowa ethanol plants can establish sizable feed shipments for wet DG for dairy and beef cattle or dry DG for hogs and poultry in the state, then Iowa plants can also capture significant operating and transportation cost advantages. ♦

Recent CARD Publications

Briefing Paper

The Long-Run Impact of Corn-Based Ethanol on the Grain, Oilseed, and Livestock Sectors: A Preliminary Assessment. Amani Elobeid, Simla Tokgoz, Dermot J. Hayes, Bruce A. Babcock, and Chad E. Hart. November 2006. 06-BP 49.

Working Papers

An Analysis of the Link between Ethanol, Energy, and Crop Markets. Simla Tokgoz and Amani Elobeid. November 2006. 06-WP 435.
Changing Diets in China's Cities: Empirical Fact or Urban Legend? Fengxia Dong and Frank H. Fuller. November 2006. 06-WP 437.

Discounting Spotted Apples: Investigating Consumers' Willingness to Accept Cosmetic Damage in an Organic Product. Chengyan Yue, Frode Alfnes, and Helen H. Jensen. November 2006. 06-WP 436.

Get a GRIP: Should Area Revenue Coverage Be Offered through the Farm Bill or as a Crop Insurance Program? Nick D. Paulson and Bruce A. Babcock. January 2007. 07-WP 440.

Intra-Industry Trade, Multilateral Trade Integration, and Invasive Species Risk. Anh T. Tu and John C. Beghin. December 2006. 06-WP 439.

Nontariff Barriers. John C. Beghin. December 2006. 06-WP 438.

MATRIC Working Paper

The Recent International and Regulatory Decisions about Geographical Indications. Stéphan Marette, Roxanne Clemens, and Bruce A. Babcock. January 2007. 07-MWP 10.